

REMARKS

This Amendment is being filed in response to the Office Action dated February 25, 2008. In view of these amendments and remarks this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Claims 1, 3, and 13-21 are amended to correct informalities. Support for the amendment to claim 18 is found in the specification at page 24, lines 4-9; page 25, lines 5-9; and Figs. 23-25.

Claims 1-21 are pending in this application. Claims 1-21 are rejected. Claims 1, 3, and 13-21 are amended in this response.

Claim Rejections Under 35 U.S.C. § 112

Claims 1-17 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The Examiner asserted that the structural relationship between the first and second gas passages and the membrane electrode assembly was not clear; and there was a lack of antecedent basis for the “gas inlet manifold” and “gas outlet manifold” in claim 3, and “the cooling mechanism” in claim 14.

These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested. The claims have been amended to address the asserted informalities.

Applicants submit that the claims fully comport with the requirements of 35 U.S.C. § 112.

Claim Objections

Claims 14-17 were objected to because they were allegedly awkwardly worded.

These objections are traversed, and reconsideration and withdrawal thereof respectfully requested. The claims have been amended to address the alleged awkward wording.

Claim Rejections Under 35 U.S.C. § 102

Claim 18 was rejected under 35 U.S.C. § 102(b) as being anticipated by Fujii et al. (US 2002/0055031). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of this invention, per claim 18, is a fuel cell comprising a membrane electrode assembly, a bipolar plate disposed outside the membrane electrode assembly and a cooling mechanism which cools the bipolar plate. The bipolar plate is solid, and comprises a gas inlet for introducing gas and a gas outlet for discharging gas. A gas diffusion layer is provided between the membrane electrode assembly and the bipolar plate. First gas passages are formed on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part. Second gas passages are formed parallel and adjacent to the first gas passages on the surface on the side of the membrane electrode assembly, wherein one end of each second gas passage is connected to the first gas passages via the return part and the other end of each second gas passage is connected to the gas outlet. The cooling mechanism cools the bipolar plate so that the temperature of the gas flowing through the first gas passages is lower as the gas inlet is nearer.

According to the invention of claim 18, the first gas passages are parallel and adjacent to the second gas passages and the gas diffusion layer is provided between the membrane electrode assembly and the bipolar plate. In the claimed structure, the water produced in the second gas passage passes through the gas diffusion layer and moves into the first gas passage and thus,

uniform water distribution can be maintained (see Specification at page 25, lines 5-9; and FIG. 25). Contrary to this, Fujii et al. prevents clogging of the condensed water by diffusing the condensed water from the cathode side to the anode side (back-diffusion) or increasing the flow rate. The above-described water movement cannot occur in Fujii et al. and uniform water distribution is not provided by Fujii et al.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Fujii et al. do not disclose a gas diffusion layer provided between the membrane electrode assembly and the bipolar plate, and first gas passages formed on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part, and second gas passages formed parallel and adjacent to the first gas passages on the surface on the side of the membrane electrode assembly, as required by claim 18, Fujii et al. do not anticipate claim 18.

Applicants further submit that Fujii et al. do not suggest the claimed fuel cell.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-3, 5, 6, and 11-14 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Kaufman et al. (US 4,588,661). This rejection is traversed, and

reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a fuel cell, comprising a membrane electrode assembly, and a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly. The bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly. A second gas passage is formed on another surface on the second side of the bipolar plate. A communicating passage allows the first gas passage and second gas passage to communicate with each other. A gas inlet introduces gas connected to one of the first gas passage and second gas passage. A gas outlet discharges gas connected to the other of the first gas passage and second gas passage.

The Examiner indicated that it would have been obvious to substitute the porous carbon plates of Kaufman et al. into the fuel cell of Fujii et al. to provide a more uniform gas distribution over the face of the respective anode and cathode to thereby improve the overall performance of the fuel cell.

According to the invention of claim 1, a bipolar plate has first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the second side of the bipolar plate. In the claimed structure, water can move through the bipolar plate and, thus uniform water distribution in the cell can be maintained (see Specification at page 8, line 13, to page 9, line 19 and FIG. 4).

Contrary to this, in Fujii et al. the passages 211A and 211B, which correspond to the first and second gas passages, are formed on the same side of the separator 10 (see FIG. 1). In addition, the passages 211A and 211B are separated by the seal CS. Therefore, even if the separator 10 were replaced with a porous carbon plate of Kaufman et al., the water movement between the passages 211A and 211B would not occur. Thus, uniform water distribution would not be obtained from the combination of Fujii et al. and Kaufman et al.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Fujii et al. and Kaufman et al. to modify the fuel cell of Fujii et al. to provide a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the second side of the bipolar plate, as required by claim 1, nor does common sense dictate the Examiner-asserted modification. The Examiner has not established that there would be any obvious benefit in making all the asserted modifications of Fujii et al. and Kaufman et al. to obtain the fuel cell. See *KSR Int'l Co. v. Teleflex, Inc.*, 500 U.S. ____ (No. 04-1350, April 30, 2007) at 20.

The mere fact that references can be combined or modified does not render the resulting combination obvious unless the prior art also suggests the desirability of the modification. *In re*

Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Applicants submit that the combination of Fujii et al. and Kaufman et al. does not suggest the claimed fuel cell.

The only teaching of the claimed fuel cell is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 4 was rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Kaufman et al. and further in view of Issacci et al. (US 2003/0129468).

Claims 7, 8, 15, and 17 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Kaufman et al. and further in view of Takahashi et al. (US 7,049,016).

Claims 9 and 10 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Kaufman et al. and further in view of Ringel (US 5,932,366).

Claims 19-21 were rejected under 35 U.S.C. § 103 as being unpatentable over Fujii et al. in view of Takahashi et al.

These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested.

The combinations of Fujii et al. and Kaufman et al. with Issacci et al., Takahashi et al., and Ringel et al. do not suggest the claimed fuel cells because Issacci et al., Takahashi et al., and Ringel et al. do not cure the deficiencies of Fujii et al. and Kaufman et al. Issacci et al., Takahashi et al., and Ringel et al. do not suggest a bipolar plate having first and second opposing sides disposed outside the membrane electrode assembly, wherein the bipolar plate is porous, and comprises a first gas passage formed on a surface on the first side of the bipolar plate facing the membrane electrode assembly, and a second gas passage formed on another surface on the

second side of the bipolar plate, as required by claim 1; and Takahashi et al. do not suggest a gas diffusion layer provided between the membrane electrode assembly and the bipolar plate, and first gas passages formed on a surface on the side of the membrane electrode assembly, wherein one end of each first gas passage is connected to the gas inlet and the other end of each first gas passage is connected to a return part, and second gas passages formed parallel and adjacent to the first gas passages on the surface on the side of the membrane electrode assembly, as required by claim 18.

The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend and further distinguish the claimed invention. For example claims 15-17 and 19-21 require a controller functioning to perform specific operations, which are not suggested by the cited references. It is well settled that it is not sufficient for a prior art controller to be merely capable of performing certain operation in order to assert obviousness, but there must be a suggestion to modify the controller to perform the claimed operation.

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

Application No.: 10/519,554

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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